

## ABSTRACT

The present invention discloses a distributed control method and system for routing message flows on a network. Each node locally computes a routing table and cooperatively exchanges control information to achieve network stability, robustness and acyclic flows. This distributed control method introduces potential functions for each class of messages to each target nodes, defined on the network nodes for determining the routes of message flows. The difference of potentials for messages of a class between a pair of neighbor nodes represents the direction and the quantity of the message flow that should be sent between the pair of neighbor nodes. Each node performs the disclosed method by, first, delivering exogenous input information for each message class to the target nodes of the messages, secondly, computing potential values for all message classes, and finally, each node computing a routing table based on the potential differences to those of its neighbor nodes and/or weights on its neighbor links.

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